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The World's Collection of Chinese Cabbage is an Important and Valuable Economic Symbol

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Abstract:

The article presents information about the valuable economic characteristics of 15 types of Chinese cabbage, that is, early ripening, productivity, and the amount of quality harvest from world collections.

Keywords: variety samples, variety, hybrid, head of cabbage, yield, early ripening, leaf, leaf surface, cabbage weight.

INTRODUCTION

In the world, the area under cultivation of Chinese cabbage is 4.1 million hectares, the average yield per hectare is 47.2 tons, and the gross yield is 193.0 million tons. Currently, Chinese cabbage is grown mainly in China (2.2 million/ha), India (511.6 thousand/ha) and the Russian Federation (171.7 thousand/ha). In connection with the growing need of the domestic and foreign markets for sources of various macro- and microelements and vitamin-rich products, the creation of high-yielding varieties and the organization of seed production is of great scientific and practical importance.

Chinese cabbage (*Brassica rapa subsp. pekinensis. L.*) is a separate independent species belonging to the cabbage family (*Brassicaceae*). This annual plant grows in East Asia, China, Japan and Korea.

Its productive member is a long corm consisting of a bunch of leaves. Fried and boiled dishes, soups, salads, pickles, marinades and canned food are prepared from it. It can also be frozen and dried. Some amateur vegetable growers began growing Chinese cabbage back in the 60s and 70s of the last century.

But now the demand for it in the markets is growing year by year. The reason for this is its high nutritional value, dietary content and healing properties. The main part of the Chinese cabbage product is water - 94%, 100 g of wet weight contains 75-80 mg% of vitamin C, vitamin B6 - 11.6%, vitamin B9 - 19.8%, vitamin K - 35.8%, vitamin A - 1.8%, vitamin B1 - 2.7%, vitamin B2 - 2.8. %, vitamin PP - 2.0%, which makes it an important valuable product of a healthy, balanced diet.

Another important aspect for the population of our country is that it is a rich source of carotene. Chinese cabbage does not have stripes. The bases of the leaves near the root are partially dense. The length of the leaves is 25-45 cm, the edges are wavy, the leaf blade is soft. The color is light green, green and dark green, slightly fleecy.

Chinese cabbage is an early ripening plant. After seed germination, the leaves can be eaten after 20–45 days, and cabbage heads after 50–80 days.

Chinese cabbage has a growth period of 70-110 days from germination to processing and 130-150 days until seed ripening. Its root system is poorly developed compared to white cabbage, so when transplanted into the ground it grows weaker and slower. Chinese cabbage is grown in open and protected areas.

Response to soil fertility. Chinese cabbage grows on soils with a heavy mechanical composition, on sandy loam soils, but gives high yields on well-fertilized light loams.

Well-prepared soils with good air aeration reduce the risk of disease.

Reaction to temperature. Chinese cabbage reacts differently to temperature during its growth stages.

Chinese cabbage is resistant to low temperatures -6-7 ^{0}C, the most favorable temperature for seedling growth is +18-20 ^{0}C, and for head formation is +20-22 ^{0}C.

A decrease in temperature from the above norms will lead to early flowering of the plant. When heads are formed at temperatures above +30 ^{0}C, heads of low quality are formed.

Reaction to humidity. To obtain a high yield of Chinese cabbage, special attention should be paid to soil moisture, since the root system of Chinese cabbage is located in the surface part of the soil.

A lack of moisture in the soil puts the plant in an unfavorable state (stress), which can result in poor tuber formation or the absence of a corm altogether.

Overwatering your plants also prevents soil aeration and the formation of quality cabbage heads. In addition, if the soil is too wet, the incidence of rotting diseases increases.

Watering should be done on time so that the area has the required amount of moisture. For this, the best soil moisture is 70-80%, and the relative air humidity is between 85-90%.

Experimental method. When conducting field experiments, such textbooks were used as "Methodology for state variety testing of agricultural crops" (Moscow, 1975), "Study and maintenance of the world collection of cabbage" (VIR, 1988); "Vegetable crop selection and seed production" (Tashkent, 1997), "Vegetable crop selection, seed production and propagation methods" (Tashkent, 2020), "Methodology for conducting experiments in vegetable growing, melon

growing and potato growing" (Azimov B.Ya., Azimov B.B., 2002), statistical analysis of the data was carried out using Microsoft Excel based on the dispersion method of B.A.Dospehov.

Experiment results. As a result of three years of research on complex characteristics, 15 of the presented 41 collection samples of Chinese cabbage brought from around the world were selected, including: collection samples K-57 "Hotoren" (Japan) were selected; K-60 "Ogata Sheodomy" (Japan); K-214 "Lo Yang Ta Pai Tsa" (China); K-220 "Fan Hsin Pai" (China); K-221 "Giant Santoh" (Japan); K-222 "Santoh Round" (Japan); K-223 "Kuriharacshantun" (Japan); K-226 "76 M(1)-4" (Taiwan); K-227 "77M(3)-25" (Taiwan); K-231 "77M(2/3)-41" (Taiwan); K-232 "Bp 79" (China); K-233 "Si-Hu Late" (Taiwan); K-239 "Aichi" (Japan); K-241 "Nozaki no.1" (Japan) and K-244 "Chee-Hoo" (Japan) (Table 1).

It was established that 6 samples of K-57 "Hotoren" (Japan); K-220 "Fan Hsin Pai" (China); k-227 "77 M(3)-25" (Taiwan); k-231 "77 M(2/3)-41" (Taiwan); K-239 "Aichi" (Japan) and K-244 "Chee-Hoo" (Japan) selected for complex traits, in comparison with the K-54 model of the Khibiny variety, have a short growth period - 7-18 days.

In contrast, the model K-54 of the Khibiny variety compared to the variety of varieties K-60 "Ogata Sheodomy" (Japan); K-214 "Lo Yang Ta Pai Tsa" (China); K-221 "Giant Santoh" (Japan); K-222 "Santoh Round" (Japan); K-223 "Kuriharacshantun" (Japan); K-226 "76 M(1)-4" (Taiwan); K-232 "Bp 79" (China); K-233 "Si-Hu Late" (Taiwan); K-241 "Nozaki no. 1" (Japan) and K-244 "Chee-Hoo" (Japan) were distinguished by a late ripening period of up to 12-25 days.

Table 1. Valuable economic characteristics of samples selected from the global gene pool of Chinese cabbage based on complex characteristics (2012-2014).

Catalog number	Name of samples	Source	Number of seedlings that produced a head, pcs.	Growing period, days	V %	Weight of a head of cabbage, kg	V%	Total yield, t/ha	V%	Productive productivity, %
к-54	**Khibinskaya, St**	Uzbekistan	44,9	103±0,7	1,9	0,55±0,12	2,9	24,6±0,33	2,6	80,2
к-57	Hotoren	Japan	41,7	85±0,6	2,0	0,46±0,10	2,1	19,2±0,26	2,7	66
к-60	Ogata Sheodomy	Japan	34,6	117,1±1,19	2,50	0,39±0,00	2,134	13,5±0,18	2,705	86,2
к-214	Lo Yang Ta Pai Tsa	China	40,6	116±0,93	1,97	0,46±0,00	2,786	19,1±0,26	2,779	86,4
к-220	Fan Hsin Pai	China	41,4	87±0,6	1,9	0,35±0,16	4,9	14,4±0,20	2,7	56,0
к-221	Giant Santoh	Japan	41,7	119±0,7	1,6	0,65±0,02	2,6	27,1±0,37	2,7	85,2
к-222	Santoh Round	Japan	35,5	115±0,7	1,6	0,85±0,01	4,1	30,1±0,42	2,7	78,6
к-223	Kuriharacshantun	Japan	28,5	120±1,2	2,5	1,20±0,01	2,3	34,2±0,46	2,7	75,8
к-226	76M(1)-4	Taiwan	40,7	127±1,4	2,8	0,64±0,03	2,6	26,5±0,35	2,6	86,2

к-227	77M(3)-25	Taiwan	41,7	88±0,5	1,7	0,35±0,07	4,0	14,5±0,20	2,7	69,4
к-231	77M(2/3)-41	Taiwan	41,7	89±0,6	1,9	0,46±0,11	2,6	19,6±0,26	2,7	56,4
к-232	BP79	China	30,3	115±0,7	1,6	1,41±0,01	2,8	42,5±0,59	2,8	65,3
к-233	Si-Hu Late	Taiwan	44,1	125±0,8	1,7	0,81±0,01	2,1	36,2±0,50	2,7	81,3
к-239	Aichi	Japan	40,5	89±0,5	1,5	0,18±0,02	5,6	7,3±0,09	2,5	39,2
к-241	Nozaki no. 1	Japan	39,5	119±0,7	1,6	0,92±0,02	2,2	36,4±0,50	2,7	65
к-244	Chee-Hoo	Japan	47,2	95±0,7	1,8	0,85±0,03	2,1	40,2±0,42	2,6	88,3

When comparing the model variety with yield, the following variety samples, divided according to complex traits, were superior to the model variety. In particular, the average yield of samples of varieties K-221 “Giant Santoh”, K-222 “Santoh Round”, K-223 “Kuriharacshantun”, K-241 “Nozaki no. 1" and K-244 "Chee-Hoo" brought from Japan is 27.1-40.2 t/ha and this is higher by 2.7-15.5 t/ha or 8.9-62.7% compared with the sample variety, and the average yield of the K-232 "Bp 79" variety, imported from China, was 42.5 t/ha, which is 17.8 t/ha or 72% higher than the sample variety. Two samples of varieties K-226 “76 M(1)-4” and K-233 “Si-Hu Late” were brought from Taiwan; the average yield was 26.5-36.2 t/ha, and it was found that the yield was 7.8-11.5 t/ha or 7.2-46.5 t/ha higher than that of the model variety Khibinskaya.

If it is established that the highest marketable yields compared to the Khibinskaya variety sample turned out to be 1.1–8.1 percent higher than the K-60 “Ogata Sheodomy” (Japan) varieties; K-214 “Lo Yang Ta Pai Tsa” (China); K-221 “Giant Santoh” (Japan); K-226 “76 M(1)-4” (Taiwan); K-233 “Si-Hu Late” (Taiwan) and K-244 “Chee-Hoo” (Japan), then the marketable yield of the remaining varietal samples K-57 “Hotoren” (Japan); K-220 “Fan Hsin Pai” (China); K-222 “Santoh Round” (Japan); K-223 “Kuriharacshantun” (Japan); K-227 “77M(3)-25” (Taiwan); K-231 “77M(2/3)-41” (Taiwan); K-232 “Bp 79” (China); K-239 “Aichi” (Japan) and K-241 “Nozaki no. 1" (Japan) is 1.6-41.0 percent lower.

It was noted that valuable economic traits, morphological indicators (2012-2014 data) of varieties selected from the world collection of Chinese cabbage for yield characteristics increased with increasing cabbage weight (kg), and the overall productivity (c/ha) increased accordingly.

As a result of research in the next period, it was noted that the average yield of the Japanese K-244 “Chee-Hoo” sample is 40.2 t/ha, which is 15.5 t/ha higher than the model variety. The head size and high marketability of this sample, as well as the short growth period (7 days), were considered superior to the model variety, and the K-244 “Chee-Hoo” line was selected, which had a high content of other valuable economic traits.

CONCLUSIONS

Based on the results of studying the collection of Chinese cabbage, samples of varieties were identified according to economic characteristics (K-222 “Santoh Round” (Japan); K-223 “Kuriharakshantun” (Japan); K-232 “Bp 79” (China); K-233 “Si -Hu Late" (Taiwan), K-241 "Nozaki no.1" (Japan)) and K-244 "Chee-Hoo" and were transferred to the breeding process to create new high-yielding, disease-resistant, high-quality, early-ripening varieties, It is advisable to use them as a primary source.

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